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(54) PASTE FOR THICK-FILM DIELECTRIC

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a paste for printing thick-film dielectric that is suited for thick-film printing, especially for fine pattern printing and can create an intricate thick film with less gap.
SOLUTION: In a paste for thick-film dielectric where a dielectric powder and a glass powder are dispersed in an organic vehicle in that an organic binder is dissolved in an organic solvent, a value obtained by evaluating the degree of dispersion in an organic vehicle of the above dielectric powder and a glass powder with a particle gauge that is prescribed by JIS K5400 is set to 4-30μm.

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CLAIMS

[Claim(s)]

[Claim 1] An organic binder is set to the paste for thick film dielectrics which dielectric powder and glass powder are distributing in the organic vehicle dissolved in the organic solvent, and it is JIS about the degree of distribution in the organic vehicle of said dielectric powder and glass powder. Paste for thick film dielectrics characterized by the value being 4-30 micrometers when the fineness gage which is prescribed by K5400 and is estimates.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About the paste for thick film dielectrics used for the thick film screen printing to a substrate top, especially, this invention is precise, and in order to obtain a thick film with few openings, it relates to the optimal paste for thick film dielectrics.
[0002]
[Description of the Prior Art] In recent years, much more miniaturization of the electronic-circuitry components containing a dielectric is called for, and in order to realize it, generally the approach of forming a dielectric by thick film screen printing on a substrate is learned. Here, the paste for dielectrics used for thick film screen printing is produced by kneading dielectric powder and glass powder to homogeneity by 3 roll mills etc. in the organic vehicle which was dissolved in the terpineol and created ethyl cellulose.
[0003]
[Problem(s) to be Solved by the Invention] However, in the conventional paste for thick film dielectrics mentioned above, there was a problem that the fine pattern printing for corresponding to densification from that of electronic-circuitry components was difficult. This is because the degree of distribution in the organic vehicle of dielectric powder and glass powder was not suitable for fine pattern printing.
[0004] The purpose of this invention is suitable for thick film screen printing, especially fine pattern printing, is precise and is to offer the paste for thick-film-dielectrics printing which can create a thick film with few openings.
[0005]
[Means for Solving the Problem] The purpose of this invention mentioned above sets an organic binder to the paste for thick film dielectrics which dielectric powder and glass powder are distributing in the organic vehicle dissolved in the organic solvent, and is JIS about the degree of distribution in the organic vehicle of said dielectric powder and glass powder. It is attained by the paste for thick film dielectrics characterized by the value being 4-30 micrometers when the fineness gage which is prescribed by K5400 and is estimates.
[0006]
[Embodiment of the Invention] The reason which the value when a fineness gage estimates set to 4-30 here is that glass powder carries out eburnation preferentially on the occasion of baking at less than 4 micrometers since glass powder is too fine, and the film uniform as a dielectric is not obtained, and is because the problem of the blinding to the screen for fine pattern printings will arise if 30 micrometers is exceeded.
[0007] Moreover, dielectric powder, such as $BaTiO_3$ and PZT, is mentioned as dielectric powder used by this invention.

[0008]
[Example] $BaTiO_3$ powder was used as dielectric powder. Moreover, mean particle diameter of glass powder was set to 5.52 micrometers, and 5 volume % addition of it was done to dielectric powder. Grinding kneading was carried out with the pot mill for 96 hours at homogeneity in the ethanol which added the organic vehicle which dissolved ethyl cellulose in the terpineol and created these, and the paste for thick film dielectrics was obtained. The value when a fineness gage estimates this paste was 15 micrometers.
[0009] The paste for thick film dielectrics was obtained like the example except having used the glass powder whose example of comparison 1 mean particle diameter is 3.93 micrometers. The value when a fineness gage estimates this paste was 3 micrometers.
[0010] The paste for thick film dielectrics was obtained like the example except having used the glass powder whose example of comparison 2 mean particle diameter is 40 micrometers. The value when a fineness gage estimates this paste

was 45 micrometers.

[0011] the thick-film dielectricity created by the example and the example 1 of a comparison, and the example 2 of a comparison -- the body and its function -- the paste was used, the printing nature test by the screen for fine pattern printings was performed, and the characterization result of the thick film dielectrics which calcinated the obtained film at 1100 degrees C further was collectively shown in Table 1.

[0012]

表1

	粒ゲージの評価値（μm）	印刷性テスト	誘電率	Q値
実施例	１５	良好	８９	１２２０
比較例１	３	良好	７１	１１８０
比較例２	４５	悪い	未実測	未実測

[0013] The property of the thick film dielectrics by the example of this invention is superior to the example of a comparison, and it turned out that it is suitable as an object for fine pattern printings so that more clearly than the result of Table 1.

[0014] Furthermore, the thick film dielectrics by the example 1 of a comparison had more openings as compared with the example than the observation result of the fracture surface by SEM, and it turned out that eburnation has not been carried out.

[0015]

[Effect of the Invention] It is suitable for fine pattern printing, and it is precise and effective in the paste for thick-film-dielectrics printing which can create a thick film with few openings being obtained.

[Translation done.]